EXPOSING THE TERMITE

★ Virginia house nearly 150 years old. It is structurally sound, with no indications of either decay or termites.

Photograph by LeRoy E. Kern.

NATIONAL
LUMBER
MANUFACTURERS
ASSOCIATION

Home of Benjamin Stoddert, first Secretary of the United States Navy. This house was built in the early part of the 19th Century on the Eastern Shore, Virginia, facing Chesapeake Bay. Although the property has had little, if any, upkeep for many years, there is no evidence of termites and the building is structurally sound. *Photograph by LeRoy E. Kern.*

PROPERLY BUILT BUILDINGS ARE NOT LIABLE TO TERMITE ATTACK

Lumber for centuries has been the preferred material for construction. The many old houses, factories and industrial buildings in excellent condition today along our Eastern and Southern seaboard furnish abundant evidence of the enduring qualities of wood. The dependability of lumber has been proven by generations of use in well-built houses. Its adaptability, ready availability, beauty, friendliness—its low cost—all have contributed to the high esteem in which it is generally held as a building material.

Properly built buildings are not liable to termite attack. Unfortunately not all buildings have been properly built according to generally acceptable construction standards; such buildings are less resistant to termite damage and decay in wood and to rust, corrosion and disintegration of other materials. Unreasonable propaganda against lumber, based on possible termite infestation, has been spread. Instances of actual and fancied termite attack have been publicized by makers of materials competing with lumber. A "termite scare" has been created and nourished by those who find in it an opportunity to profit at the expense of the building owner.

To enable the public to know the truth about the termite and thus eliminate the element of fear which may have resulted from this exaggerated propaganda, this publication is issued. It is based largely on facts developed through years of research by the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture. When the danger of termite attack exists, it may be guarded against by simple and inexpensive measures. This applies to all types of building, since it is the method of construction rather than the material which insures against termite damage. The public generally does not know that while termites eat wood because of its cellulose content, they will also eat paper and rags, and are known to bore through lead, rubber, leather, fabric, poor grades of mortar, etc. Therefore, it must again be emphasized that even though construction involves the use of no wood at all, it does not protect the contents of the building against termite ravages. For where termites are present the prevention of their entrance into a building through the use of actual barriers is essential in any kind of construction.

THE TERMITE'S HISTORY

Termites, or so-called "white ants," are social insects which live in colonies made up of different forms or castes. True ants are enemies of the termite.

At certain seasons, usually spring or fall, but varying with the species and the locality, the winged, sexual individuals migrate from the parent nests to form new colonies. These swarming or flying termites do not attack wood or other articles. The descendants of these winged migrants, the workers—cream colored "white ants"—are the destructive members of the colony. These are blind, shun the light and conceal themselves in their shelter tubes or runways. *Termites can't stand exposure.*

The termite is an ancient insect. Fossil termites have been found in this country, indicating existence of their colonies 55,000,000 years ago, and among some of these are species practically identical with the destructive subterranean species found in the United States today. Thus, termites were on this globe before the human race, which quite emphatically disposes of the frequent statements that they are comparatively new. The social organization and habits of the termite appeal to the imagination of the feature writer and emphasis on the "enemy of mankind" characteristic of so many articles is a bid by its writer for newspaper space.

Termites are more numerous in the Southern, the Southwestern and the Southern Pacific Coast regions than elsewhere in the United States.

Contrary to frequent misstatements, there has been no introduction nor spread of termites from the tropics to the United States, nor of native forms from the southern to the northern states.

Winged Migratory Subterranean Termite Enlarged eight times.

Subterranean Termite Workers Enlarged eight times.

There are two types of termites, the non-subterranean and the subterranean. The non-subterranean termite exists in only a small portion of the extreme southern part of this country and as it causes a comparatively negligible proportion of termite damage it is not discussed here. Simple precautions against damage by the **subterranean** termite are given in this publication.

FIVE TRUTHS ABOUT TERMITES

1. The potential danger of termite damage is an object of gross exaggeration. Termites are not spreading over the country, nor are they of recent origin.

2. All cellulose materials and many others may be eaten or attacked by termites. The use of wood, either treated or untreated, concrete, brick, steel or tile, does not of itself insure against these insects. It is the METHOD of construction that effectively safeguards against termites.

3. In order to live, termites must have moisture. The home of the termite is in the ground where it finds an unfailing source of moisture and shelter. DESTROY THE GROUND CONTACT AND YOU DESTROY THE TERMITE. *Termites can't stand exposure.*

4. Termites are not brought into a building in either new or old lumber.

5. Lumber used in buildings properly constructed is in no danger of being damaged by termites.

(Photographs, courtesy U. S. Bureau of Entomology and Plant Quarantine.)

TERMITES ARE NOT SPREADING FROM THE TROPICS

WHAT TERMITES DO

Termites eat cellulose materials and attack many others. Proper construction at little additional cost will keep termites out of buildings in which these materials are to be found. Wood, masonry, concrete, brick, hollow tile, stucco, steel and even rammed earth can be effectively used so that the building will not be attacked by termites.

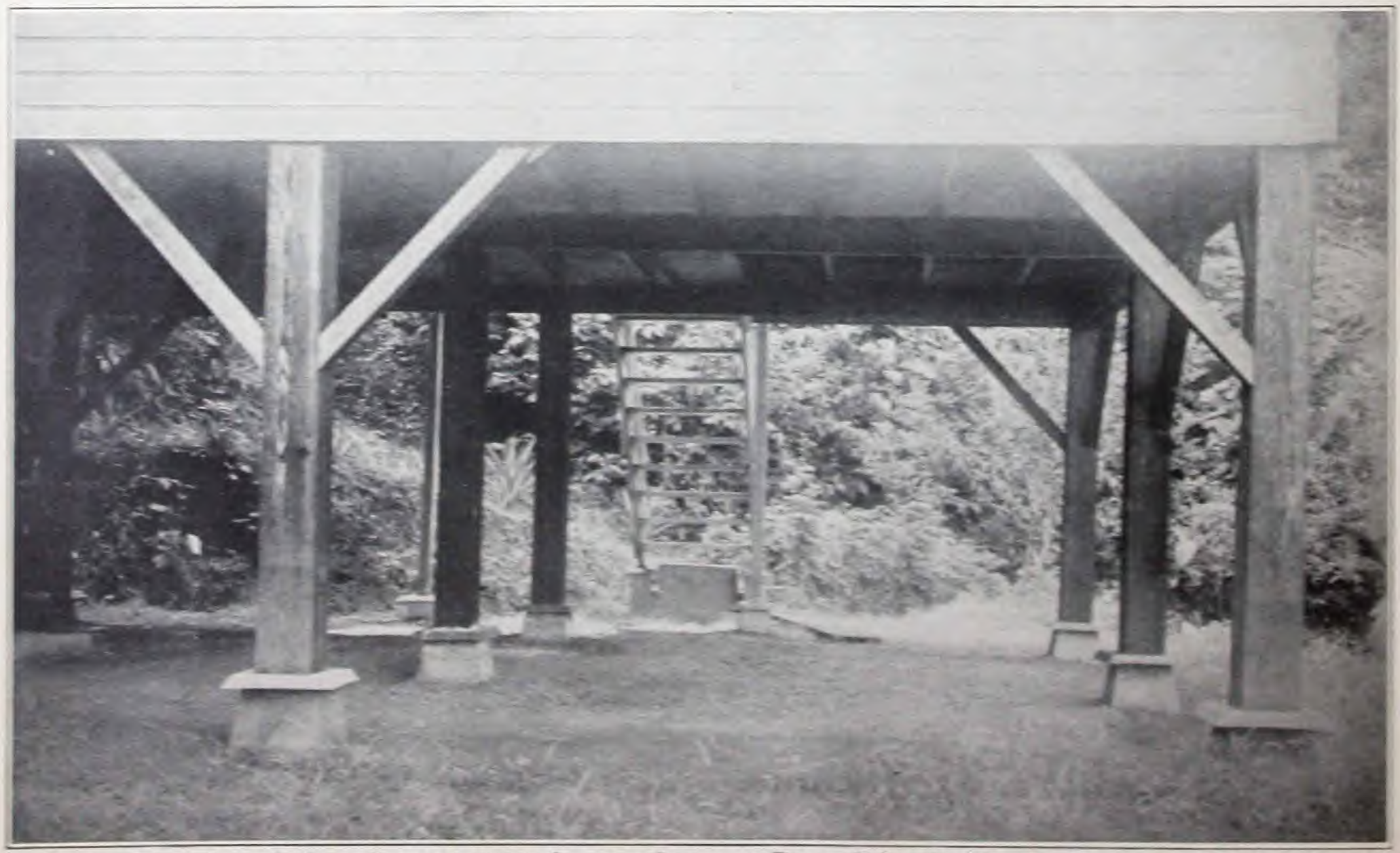
HOW TERMITES GET INTO BUILDINGS

The invasion of a building by subterranean termites has its source from underground communities through foraging tunnels made by the workers.

Termites enter buildings through cracks in concrete or masonry walls, through timbers or by building earthlike shelter tubes over these materials. They may also build shelter tubes along the surfaces of pipes, fence posts, trellises, etc., and thereby gain entrance to buildings.

It is not the age of the building, but the improper manner in which it has been constructed that makes possible an attack by termites.

Test house built in 1927 at Barro Colorado Island, Panama, of untreated lumber protected with termite shields. Although located in a highly termite infested country, this house, after ten years, is still entirely free from termites. *(Photo by T. E. Snyder)*



View of termite shields and posts supporting test house at Barro Colorado Island. Note the arrangement at the base of the steps to guard against termites. *(Photo by T. E. Snyder)*

PROPER METHODS OF BUILDING

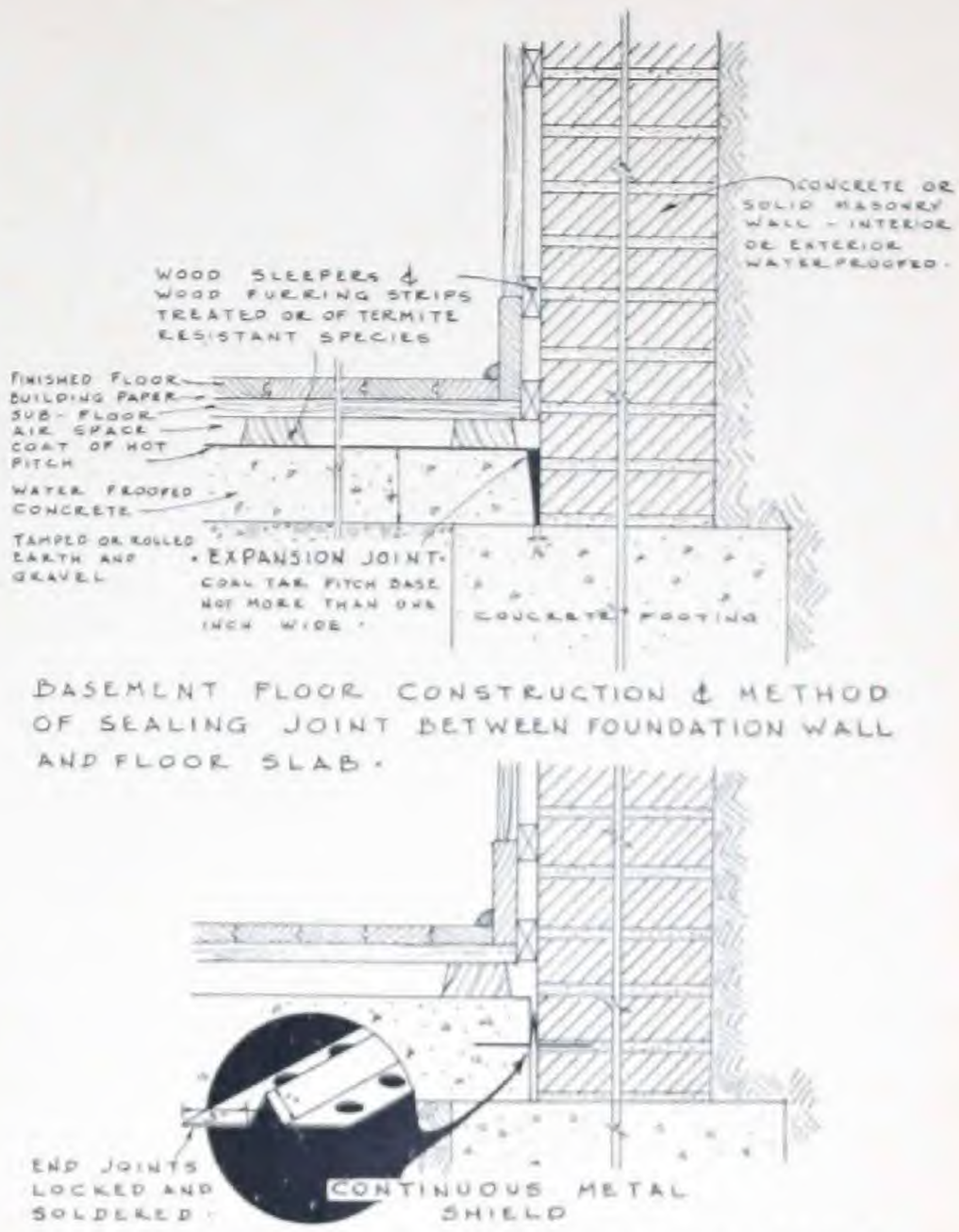
Termites must maintain contact with the ground to obtain the moisture necessary for their existence. Obviously the first consideration should be to build in a manner which will prevent the entry of termites from the ground. That this can be done at only a slight additional cost has been well demonstrated.

Foundations

The foundations of buildings should be constructed of masonry, of approved pressure treated,* or naturally termite-resistant lumber. Where a basement is provided the foundation walls should be of masonry construction. If unit block construction is employed, as brick, tile, cement blocks, etc., all joints should be well filled with mortar and the wall topped with a 2-inch cap of cement. This should be reinforced to prevent cracking when over open type units as cement blocks or vertical opening tile. The ground within the basement should be sealed over with concrete; posts should not extend through the floor into the soil but should rest on concrete footings that extend at least two inches above the floor.

If foundations are built over an earth fill or naturally loose earth, subsequent settlement may cause the joint between the concrete basement floor and foundation wall to open up. Such a joint is a probable source of termite entry and should be guarded against by installing a mastic or a metal expansion joint between the wall and floor. See Figure 1.

Concrete for basement floors and walls should be a dense mixture and the walls reinforced with steel rods at the corners and intersections to tie them together. Improper construction of the basement floor and walls may cause cracks to develop through which termites may gain free access from the earth.



BASEMENT FLOOR CONSTRUCTION & METHOD OF SEALING JOINT BETWEEN FOUNDATION WALL AND FLOOR SLAB.

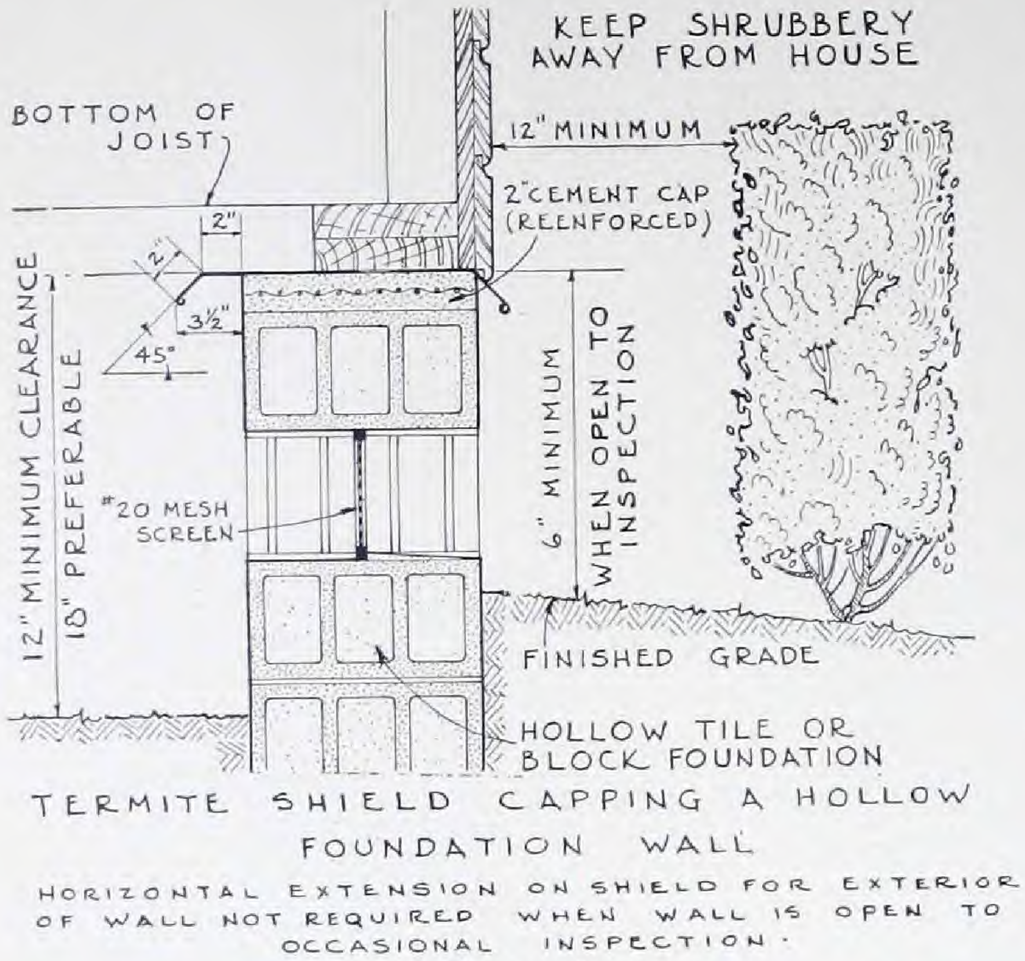
ALTERNATE METHOD OF SEALING JOINT.

Figure 1.

Window sills and frames in the basement should not come in direct contact with the ground, nor should leaves or debris be allowed to collect and remain in contact with them.

Buildings which have no basements should have the sills set a minimum of 12 inches—and preferably 18 inches—above the excavated ground or natural grade at all points, to afford the necessary clearance and good ventilation. See Figure 2. On the exterior, the ground clearance to woodwork may be reduced to 6 inches above the finished grade line, provided the foundation walls permit access to occasional inspection for shelter tubes by the home owner. In the case of solid foundations, ventilation should be provided by allowing not less than two square feet of net open area for every twenty-five linear feet of wall. Openings should be screened with 20-mesh non-corroding screening.

* Bureau of Entomology and Plant Quarantine recommends Federal Master Specifications TT-W-571a.



TERMITE SHIELD CAPPING A HOLLOW FOUNDATION WALL

HORIZONTAL EXTENSION ON SHIELD FOR EXTERIOR OF WALL NOT REQUIRED WHEN WALL IS OPEN TO OCCASIONAL INSPECTION.

Figure 2.

The support of porches or steps should not be laid directly on the ground, but should rest on solid masonry, pressure-treated lumber or heartwood lumber of termite resistant species. See Figure 3.

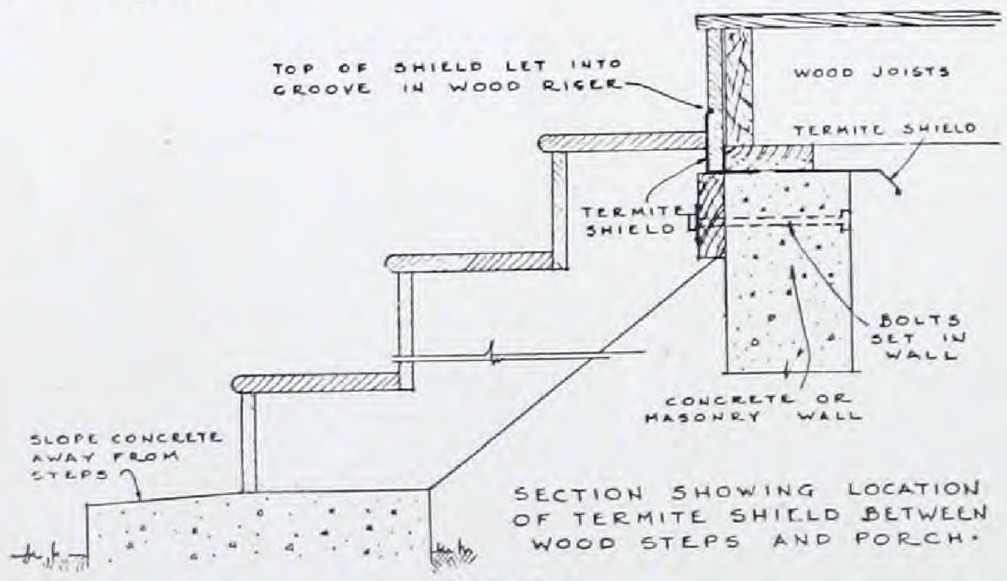


Figure 3.

All lumber which comes in contact with the ground should be pressure treated with a preservative, or be the heartwood of a termite resistant species.

Termite Shields

Termites require constant access to soil moisture and unless they stay in a moist atmosphere they soon die. Because of this need for moisture, termites construct shelter tubes of earth or waste material to carry moisture and to act as passageways between the ground and their food supply when it is not in contact with the soil. Destroy or prevent this ground contact and the termites cannot damage the building.

These shelter tubes may be constructed over the face of stone, concrete, brick or timber foundations and along water pipes or similar structures. Such contacts may be prevented by means of a metal shield barrier. This is called a "termite shield," and consists of non-corroding metal firmly inserted and pointed into a masonry joint or under the sill, projecting horizontally at least 2 inches beyond the face of the wall and then turned downward an additional 2 inches at an angle of 45 degrees. All joints should be locked (and preferably soldered also) with corners made tight, and the outer edge rolled or crimped to give stiffness against bending as well as to eliminate a sharp edge.

The termite shield should be used on each face of all foundation walls, except that it may be omitted from a face, either interior or exterior, which is exposed and open to easy and ready inspection. However, around houses and places where shrubbery may partly conceal the wall and inspection is likely to be infrequent, a modified shield may be used. Here the horizontal projection is omitted and the 2-inch projection bent downward at 45 degrees is employed. Satisfactory termite shields may be made from either 26-ga. galvanized sheet steel or 16-oz. copper.

Piers, Posts and Piping

Where masonry or concrete piers are used to support the building, a two-inch cap of Portland cement mortar should be placed on top of the piers and non-corroding metal termite shields placed around the piers on the cement cap. See Figures 4 and 5.

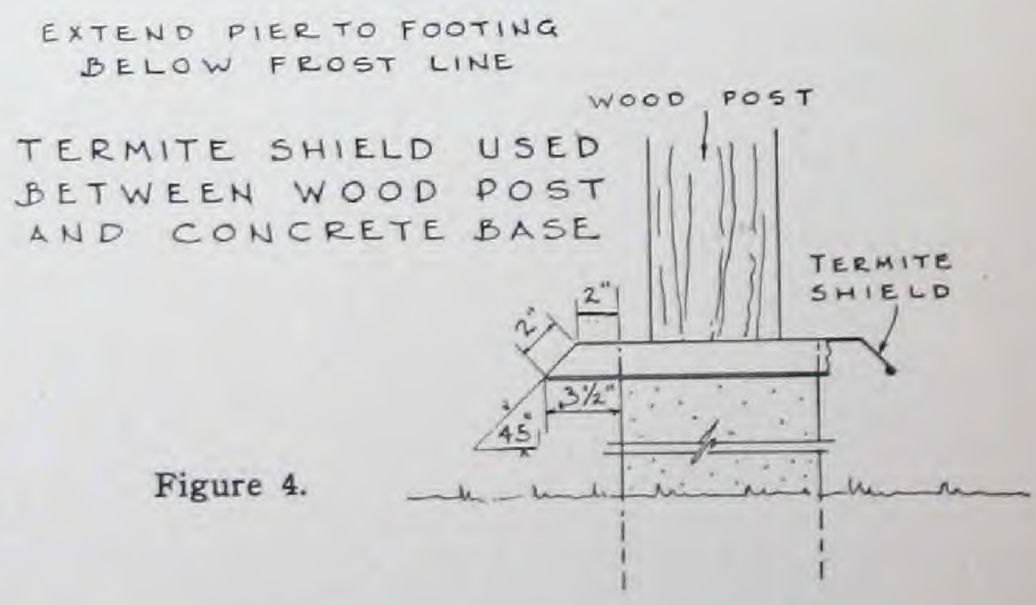
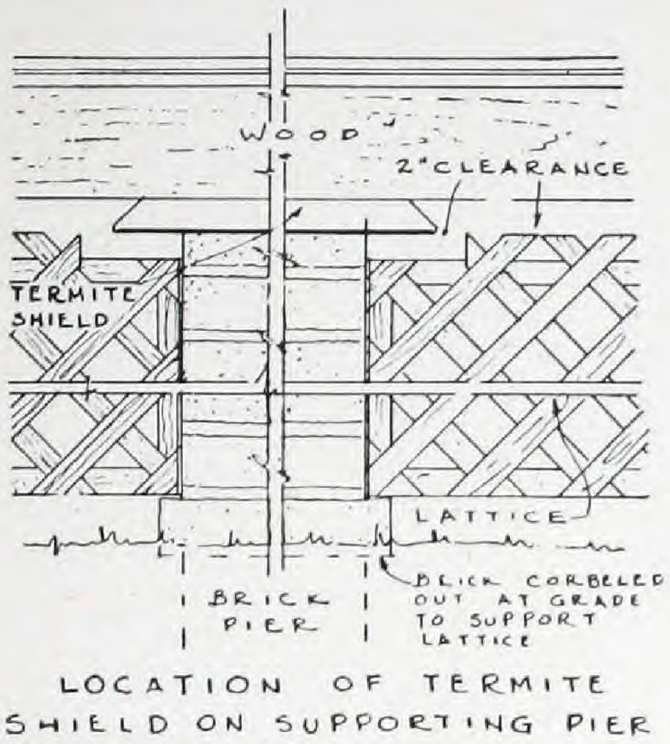


Figure 4.

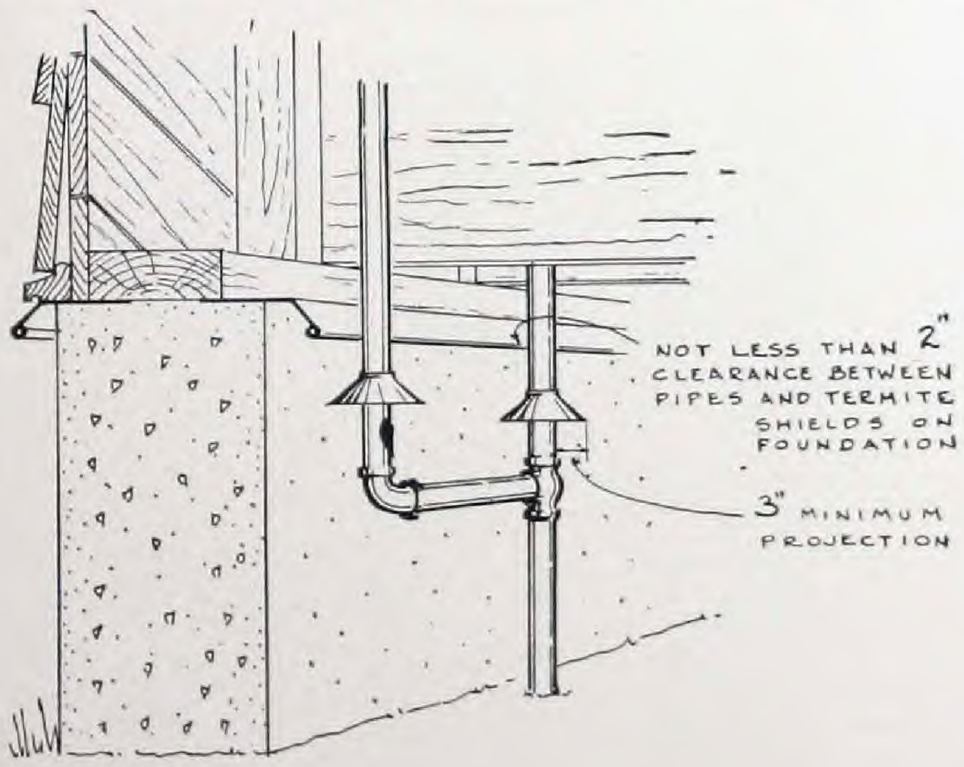
Where pressure-treated wood posts or posts of termite-resistant wood are used in contact with the earth, non-corroding metal caps of the solid pan type should be placed over the tops of the posts. The capping should extend outward and downward to form the termite shield.



LOCATION OF TERMITE SHIELD ON SUPPORTING PIER

Figure 5.

Pipes extending through concrete floors of basements or through masonry walls will make infestation possible unless a tight joint is secured about them. Cement mortar carefully worked around such pipes, rods, etc., should be sufficient, except where there is a possibility of settlement over a fill or too much vibration as in a factory, or along a railroad. For these latter cases, a tightly fitting metal collar soldered to the pipe and embedded into the cement is recommended.



TERMITE SHIELDS AROUND PIPES AND AT TOP OF FOUNDATION WALL.

Figure 6.

Pipes extending into the ground should be protected by a metal collar or shield (soldered to the pipes at least 12 inches and preferably 18 inches above the earth) having a horizontal projection from the pipe of at least 3 inches at their lower edge to obstruct possible entry pathways for termites. See Figure 6.

Sills—Plates

Where a solid masonry or concrete foundation wall is used, wood plates, sills and similar members should be laid on a newly laid mortar cap at least one inch thick on the foundation. This will assure a uniform bearing surface. The termite shield should be placed over the foundation at this point and embedded into the mortar cap.

Foundations built of hollow masonry units and capped with 2 inches of cement mortar should have a further bed of mortar on which the sills should be laid, thereby securing a uniform bearing surface. The termite shield should be placed over the foundation at this point and embedded in the mortar.

Drainage

The soil beneath and around the building should be provided with adequate drainage.

Cleaning Grounds

Debris and form lumber should be cleared from under floors, porches and around foundation walls and not used as fill in place of earth.

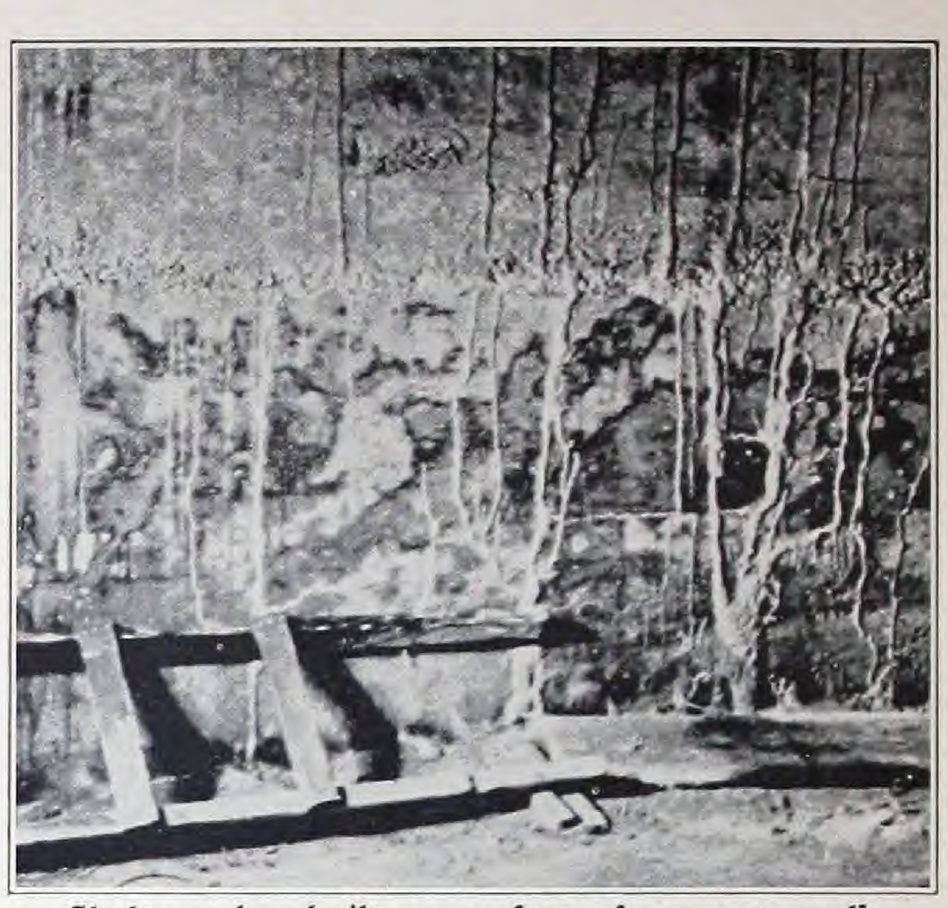
Fences, Trellises, Etc.

Fences, trellises, etc., should be kept at least two inches away from the building and shrubbery at least twelve inches.

DETERMINING PRESENCE OF TERMITES

Except at swarming time, termites are not visible unless their galleries or passageways are broken open. The earth colored shelter tubes offer a ready means of recognizing their activities. Their work can usually be detected in wood by striking it with a hammer. Solid wood rings clear, while timber or woodwork eaten out by termites will give a dull thud when struck. Striking with an ice pick also determines weakened wood.

Clean-cut holes in books, papers and clothing are good indications of the presence of termites. Springy basement floors or the softening or weakening of woodwork suggest repairs because of termite or other damage.



Shelter tubes built on surface of concrete wall.
(Photograph, courtesy U. S. Bureau of Entomology and Plant Quarantine.)

HOW TO STOP TERMITE DAMAGE

Where termites are discovered in a building, the methods of stopping termite injury are substantially the same as those to be employed in new construction to prevent their entry. Inasmuch as contact with soil moisture is absolutely essential to the life of termites, corrections which permanently break and make impassable the ground connections maintained between the parent soil colony and a building will result in the prompt dying of any termites remaining in the building. However, if through water leakage, or other source, moisture is provided above the ground contact, termites cut off in the building may continue to work as long as this condition exists.

Break Contact with Ground

Examine the foundation walls and posts or piers for termite shelter tubes. Break these shelter tubes and then proceed to make repairs and replacement to prevent future damage. If the foundation is of masonry or concrete, inspection should be made for cracks or openings through which termites can build their shelter tubes. All cracks should be carefully sealed and a capping of dense Portland cement mortar placed over the foundation. Where the foundation is of untreated wood and in contact with the ground, it should be replaced with wood that is pressure treated with an approved preservative, with wood that is termite resistant, or be replaced with concrete or masonry.

The termite shields of metal already recommended for new construction should then be inserted over, or in, the masonry foundation of buildings or around piers, posts, walls, piping, etc., below the superstructure.

Termite tube following crack in concrete foundation.
(Photograph, courtesy U. S. Bureau of Entomology and Plant Quarantine.)

Soil Poisons

In the case of masonry or concrete walls or piers, which have disintegrated or cracked, or are of a type of construction that cannot be sealed off by capping with concrete on top of the foundation, thus permitting termites to construct their earthlike shelter tubes on the inside, it may be necessary to use soil poisons as a more or less temporary measure for preventing termite damage.

An economical soil poison is one part creosote oil to 2 or 3 parts kerosene or mineral spirits (dilution depends on density of soil). If the odor of creosote is objectionable (it will disappear in a short time if there is proper ventilation) orthodichlorobenzene (full strength) or paradichlorobenzene crystals may be used. In the northern states it is well to use these crystals only during warm weather when soil temperatures are relatively high. The chemical should be applied in a shallow trench about one foot wide (it is well to also loosen the earth as deeply as possible below the trench) against all walls, piers, pipes and on the exterior and interior sides of all exterior walls, step and stair foundations, etc. The creosote mixture should be used at the rate of one gallon per 10 lineal feet of trench; orthodicholorbenzene at the rate of one gallon per 10 lineal feet of trench and paradichlorobenzene at the rate of 5 pounds of crystals per 10 lineal feet of trench. All wood and other debris, termite shelter tubes, etc., should be thoroughly removed from the soil and walls before applying chemicals. Orthodichlorobenzene is harmful to living vegetation.

It is well to inspect the work about 3 to 4 weeks after the poisoning is completed, and re-poison if there are any indications of continued termite activity.

The building should be regularly inspected about 4 weeks after the semi-annual "flying time" (in spring and fall, varies according to species of termites and locality) and re-poisoning done if there is evidence of new infestation.

TERMITE FEARS EXAGGERATED

Without desire to minimize the damage which may be occasioned to buildings and contents from termite attack, especially if long continued, it should nevertheless be pointed out that particularly in the temperate zones, serious termite damage to buildings is relatively infrequent and termite work may go on for years without involving necessity for extensive repairs.

Once having invaded a building, however, termites will continue their work and extend their damage slowly or rapidly unless and until their means of entrance from the outside has been broken by corrective measures. With the breaking of the connection between the building and the external soil moisture, all the termites in the building promptly die and injury ceases. *Termites can't stand exposure.*

NOT ALL TERMITES ATTACK WOOD

In connection with the foregoing discussion, it is well to point out that in certain areas, particularly in the southwestern states, there occur types of termites which never feed upon, nor can they digest, sound wood—hence they never attack such wood in buildings or elsewhere. These types feed on low vegetation—grasses, etc., the stems of which they cover with earthlike tubes and the resulting partially decayed vegetable matter, is the only food on which they can subsist. The presence of the earthlike tubes of these termites near or even under houses or the presence of the winged forms, may be wrongly interpreted as indicating liability of invasion by one of the destructive termites and therefore, the house owner should make sure that any agency exploiting termite control is able to distinguish between this form and the destructive type of termites.

The National Lumber Manufacturers Association expresses its grateful appreciation to Dr. Thomas E. Snyder, Senior Entomologist, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, for the detailed and valuable information made available during the preparation of this booklet.

TERMITE PREVENTION MEASURES

1. *Prevent passage of termites to the moist ground and those in the building will soon die.*

2. *Extend foundations at least 12 inches and preferably 18 inches above ground under the building. The exterior grade line may be a minimum of 6 inches from the sills or siding if foundations can be readily inspected for shelter tubes.*

3. *Where wood is used in contact with the soil, or is less than 12 inches from the ground and not protected by a termite shield, except for the exterior 6-inch minimum clearance as noted in Recommendation No. 2, it should be pressure-treated* with an approved preservative or be the heartwood of a termite resistant species.*

4. *Place metal termite shields at the upper edges or in the sides of all foundation walls and piers and around all pipes entering buildings, except on exterior surfaces and basement or cellar interiors which are open to easy occasional inspections. Foundations not easily inspected should have termite shields set at least 12 inches and preferably 18 inches above the ground.*

5. *Provide a solid cement cap 2 inches thick over foundations if unit or block construction is used. Reinforce this cap over cement blocks or vertical opening tile.*

6. *Remove all debris, whether above or below the ground, from around foundations and under the building.*

7. *Insulate outside steps from the soil by masonry foundations, also insulate steps from houses or porches by metal shields.*

8. *Allow plenty of ventilation under the building by having an 18-inch clearance and openings in solid foundations at the rate of 2 square feet of net area for every 25 linear feet.*

9. *Keep openings for air passage well screened with 20-mesh screen and do not allow openings to become overgrown with vegetation.*

10. *Make occasional inspections for termite shelter tubes and if any are found, break them off and treat the ground with suitable poisons.*

11. *If termites are suspected in woodwork, investigate by striking with a hammer or boring into it with a small-sized bit or striking with an ice pick. Termite chambers offer little resistance when boring through them.*

12. *Replace all structural members weakened by termites and make repairs following recommended practice to prevent further termite attack.*

13. *Keep soil near foundations dry by not allowing outside faucets to drip or ice boxes to drain near the walls of the house.*

---

* *Bureau of Entomology and Plant Quarantine recommends Federal Master Specifications TT-W-571a.*

REFERENCE PUBLICATIONS

Other publications on the subject of termites are listed below. The first four are available on request from the U. S. Department of Agriculture, Washington, D. C.

"Preventing Damage by Termites or White Ants"—U. S. Department of Agriculture Farmers Bulletin No. 1472.

"Injury to Buildings by Termites"—U. S. Department of Agriculture Leaflet No. 101.

"Specifications for Remedying Termite Damage to Various Types of Buildings"—U. S. Department of Agriculture Specification E 327.

"Provisions for Building Codes Insuring Protection from Termites and Decay"—Department of Agriculture Specification E 338.

"What, Where, When and Why Are Termites" by Dr. Thomas E. Snyder—Occasional Paper No. 52, Southern Forest Experiment Station, New Orleans, La.

Papers by Dr. Thomas E. Snyder, Senior Entomologist, Bureau of Entomology & Plant Quarantine, U. S. Department of Agriculture, New Orleans, La., include:

"Termite Control"

"Research on Termites in the United States"

"The Prevention of Termite Damage to Buildings Is Entirely a Municipal Problem."

"Our Enemy the Termite"—Snyder, T. E., 1935, Comstock Publishing Company, Ithaca, N. Y. Price, $3.00.

"Termites and Termite Control"—Kofoid, Light, Horner, Randall, Herms, Bowe, 1934 (A Report to the Termite Investigations Committee), University of California Press, Berkeley, California.

"Termites and Termite Damage"—Light, S. F., 1929, University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California.

"Habits and Control of Termites"—Miller, A. E., 1928, State Natural History Survey Division, Department of Registration and Education, Urbana, Illinois.

"Uniform Building Code"—Pacific Coast Building Officials Conference, 124 West Fourth Street, Los Angeles, California.

"Building Code"—Recommended by National Board of Fire Underwriters, 85 John Street, New York City, New York.

"Termite Control in Buildings in Connecticut"—Turner, N., and Townsend, J. E.; Connecticut Agriculture Experiment Station Bulletin No. 382, New Haven, Conn.

This building was owned at one time by George Washington, who sold it in 1761 to his brother-in-law. When photographed and inspected in 1937 it was still free from decay and termites. No structural repairs have been made since 1865. P. V. Daniel House, Fredericksburg, Virginia. *Photograph by LeRoy E. Kern.*

WHERE ADDITIONAL LUMBER INFORMATION MAY BE OBTAINED

THIS publication is a part of the service to distributors and consumers of lumber sponsored by the National Lumber Manufacturers Association. It is suggested that those desiring additional information regarding the respective species of wood write the following regional associations:

American Walnut Manufacturers Association ..... Chicago, Ill.
American Walnut.

Appalachian Hardwood Manufacturers, Inc. ..... Cincinnati, O.
Appalachian Ash, Basswood, Beech, Birch, Butternut, Chestnut, Cherry, Elm, Hickory, Maple, Yellow Poplar, Red Oak, White Oak, Walnut.

California Redwood Association ..... San Francisco, Cal.
California Redwood.

Hardwood Dimension Manufacturers Association ..... Louisville, Ky.
American Walnut, Ash, Basswood, Beech, Birch, Butternut, Chestnut, Cherry, Elm, Hickory, Maple, Yellow Poplar, Red Oak, White Oak, Hemlock, Tamarack, White Pine, Cypress (yellow), Cottonwood, Gum (black), Gum (red and sap), Hackberry, Hickory, Magnolia, Pecan, Persimmon, Sycamore, Tupelo, Willow.

Mahogany Association, Inc. ..... Chicago, Ill.
Mahogany.

Maple Flooring Manufacturers Association ..... Chicago, Ill.
Maple, Beech and Birch Flooring.

Northeastern Lumber Manufacturers Association ..... New York, N. Y.
Northern White Pine, Norway Pine, Eastern Spruce, Balsam Fir, Northern Hardwoods.

Northern Hemlock and Hardwood Manufacturers Association ..... Oskosh, Wis.
Hemlock, Birch, Maple, Basswood, Elm, Ash, Beech, Tamarack, White Pine.

Northern Pine Manufacturers Association ..... Minneapolis, Minn.
Northern White Pine, Norway Pine, Eastern Spruce, Tamarack.

Southern Cypress Manufacturers Association ..... Jacksonville, Fla.
Tidewater Red Cypress.

Southern Hardwood Producers, Inc. ..... Memphis, Tenn.
Ash, Basswood, Beech, Cypress (yellow), Cottonwood, Elm, Gum (black), Gum (red and sap), Hackberry, Hickory, Maple (soft), Magnolia, Oak (white), Oak (red), Poplar, Pecan, Persimmon, Sycamore, Tupelo, Willow.

Southern Pine Association ..... New Orleans, La.
Longleaf and Shortleaf Southern Pine.

West Coast Lumbermen's Association ..... Seattle, Wash.
Douglas Fir, West Coast Hemlock, Sitka Spruce, Western Red Cedar, Port Orford Cedar.

Western Pine Association ..... Portland, Ore.
Ponderosa Pine, Idaho White Pine, Sugar Pine, Larch, Douglas Fir, White Fir, Engelmann Spruce, Red Cedar, Incense Cedar.

The Veneer Association ..... Chicago, Ill.

NATIONAL LUMBER MANUFACTURERS ASSOCIATION

1337 CONNECTICUT AVE., WASHINGTON, D. C.

FIELD OFFICES

CHICAGO — NEW ORLEANS — SAN FRANCISCO

COOPERATING ORGANIZATIONS

Douglas Fir Plywood Association ..... Tacoma, Wash.
National Hardwood Lumber Association ..... Chicago, Ill.
National-American Wholesale Lumber Association ..... New York, N. Y.
National Retail Lumber Dealers Association ..... Washington, D. C.
National Association of Commission Lumber Salesmen ..... Cleveland, O.
National Door Manufacturers Association ..... Chicago, Ill.
National Association of Hardwood Wholesalers ..... Chicago, Ill.
National Wholesale Lumber Distributing Yard Association ..... Baltimore, Md.
Red Cedar Shingle Bureau ..... Seattle, Wash.

2-37—10M
4-37—10M
6-37—25M
12-40—50M

Printed in U. S. A.